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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,144	08/27/2004	Douglas D. Coolbaugh	BUR920040107US1	5143
45601 7590 10/15/2007 SCULLY, SCOTT, MURPHY & PRESSER, P.C. 400 GARDEN CITY PLAZA Suite 300 GARDEN CITY, NY 11530			EXAMINER NGUYEN, KHIEM D	
			ART UNIT 2823	PAPER NUMBER
			MAIL DATE 10/15/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/711,144

Applicant(s)

COOLBAUGH ET AL.

Examiner

Khiem D. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-9 and 11-20 is/are pending in the application.
- 4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-9 and 11-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 5-9 and 11-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Gau (U.S. Patent 6,949,440).

In re claim 1, Gau discloses a varactor structure comprising: a semiconductor substrate 40 of a first conductivity type, the substrate 40 including a subcollector 42 of a second conductivity type (col. 4, lines 11-30) located below an upper region of the substrate 40, the first conductivity type is different from the second conductivity type; a well region located in the upper region of the substrate 40, wherein the well region includes outer well regions 44/48 of the second conductivity type and an inner well region 46 of the first conductivity type, each well of alternating conductivity type of the well region is separated at an upper surface by an isolation region 50 (col. 4, lines 31-40 and FIG. 11) and

each outer well region has an upper surface which includes a source/drain region 60/62 (col. 4, lines 57-67); and a field effect transistor having at least a gate conductor 58 of the first conductivity type located above the inner well region 46 (col. 4, line 67 to col. 5, line 6 and FIG. 11).

In re claim 2, as applied to claim 1 above, Gau discloses all claimed limitations including the limitation wherein the first conductivity type comprises a p-type dopant and second conductivity type comprises a n-type dopant (col. 4, lines 11-30).

In re claim 3, as applied to claim 1 above, Gau discloses all claimed limitations including the limitation wherein the first conductivity type comprises a n-type dopant and the second conductivity type comprises a p-type dopant (col. 4, lines 11-30).

In re claim 5, as applied to claim 1 above, Gau discloses all claimed limitations including the limitation wherein each well region extends beneath the isolation region 50 to the subcollector such that neighboring well regions are in contact with each other along the entire extension of each well region beneath the isolation region (FIG. 11).

In re claim 6, as applied to claim 1 above, Gau discloses all claimed limitations including the limitation wherein the upper region of the substrate 40 comprises an epitaxial semiconductor layer (col. 3, lines 25-44).

In re claim 7, as applied to claim 1 above, Gau discloses all claimed limitations including the limitation wherein the field effect transistor further comprises a gate dielectric located beneath the gate conductor 58, a hard mask located on the gate conductor, at least one spacer 66 located on sidewalls of the gate conductor 58 and abutting source/drain regions 62 (col. 4, line 67 to col. 5, line 5 and FIG. 11).

In re claim 8, as applied to claim 1 above, Gau discloses all claimed limitations including the limitation wherein the gate conductor 58 comprises polysilicon (col. 3, lines 35-38).

In re claim 9, Gau discloses a varactor structure comprising a p-type semiconductor substrate 40, the p-type substrate including an n-type subcollector 42 located below an upper region (col. 4, lines 11-30) of the substrate 40; a well region located in the upper region of the substrate 40, wherein the well region includes outer N-well regions 44/48 and an inner P-well region 46, each well of alternating conductivity type of the well region is separated at an upper surface by an isolation region 50 (col. 4, lines 31-40 and FIG. 11) and

each outer well region has an upper surface which includes a source/drain region 60/62 (col. 4, lines 57-67) and a field effect transistor having at least a p-type gate conductor 58 located above the inner P-well region (col. 4, line 67 to col. 5, line 6 and FIG. 11).

In re claim 11, as applied to claim 9 above, Gau discloses all claimed limitations including the limitation wherein each well region extends beneath the isolation region 50 to the subcollector such that neighboring well regions are in contact with each other along the entire extension of each well region beneath the isolation region (FIG. 11).

In re claim 12, as applied to claim 9 above, Gau discloses all claimed limitations including the limitation wherein the upper region of the substrate 40 comprises an epitaxial semiconductor layer (col. 3, lines 25-44).

In re claim 13, as applied to claim 9 above, Gau discloses all claimed limitations including the limitation wherein field effect transistor further comprises a gate dielectric located beneath the gate conductor 58, a hard mask located on the gate conductor 58, at

least one spacer 66 located on sidewalls of the gate conductor 58 and abutting source/drain regions 62 (col. 4, line 67 to col. 5, line 5 and FIG. 11).

In re claim 14, as applied to claim 9 above, Gau discloses all claimed limitations including the limitation wherein the gate conductor comprises polysilicon (col. 3, lines 35-38).

Response to Applicants' Amendment and Arguments

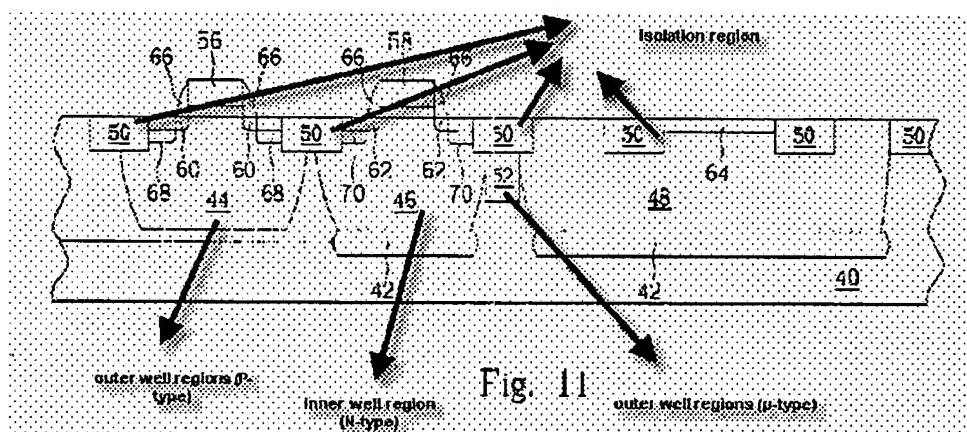
3. Applicants' arguments filed August 01st, 2007 have been fully considered but they are not persuasive.

Applicants contend that the reference Gau (U.S. Patent 6,949,440), herein known as Gau, fails to disclose, inter alia, "a well region located in the upper region of the substrate, wherein the well region includes outer well regions of the second conductivity type and an inner well region of the first conductivity type, each well of alternating conductivity type of the well region is separated at an upper surface by an isolation region and each outer well region has an upper surface which includes a source/drain regions".

In response to Applicants' contention that Gau does not teach or suggest a well region located in the upper region of the substrate, wherein the well region includes outer well regions of the second conductivity type and an inner well region of the first conductivity type, each well of alternating conductivity type of the well region is separated at an upper surface by an isolation region, Examiner respectfully disagrees.

Applicants' attention is respectfully directed to (col. 4, lines 11-65 and FIGS. 8-10, for example) where Gau discloses a varactor structure comprising: a well region

located in the upper region of the substrate 40, wherein the well includes outer well regions 44 and 52 of the second conductivity type (P-type) (see col. 4, lines 27-40) and an inner well region 46 of the first conductivity type (N-type) (col. 4, lines 41-42), each well of alternating conductivity type (P-N-P) of the well region is separated at an upper surface by an isolation region 50 (see col. 4, lines 31-40 and FIG. 11, as shown below, for example).



For this reason, Examiner holds the rejection proper.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

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advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D. Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:30 AM - 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KN
October 05, 2007

Brook Kebede
BROOK KEBEDE
PRIMARY EXAMINER